

STRUCTURAL HEALTH MONITORING

10-03-2026



XXXXXXXXXXXX,
Hyderabad, Telangana



STRUCTURAL HEALTH MONITORING



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Customer Name:

xxxxxxxxxxxxxxxxxx, Hyderabad,
Telangana

Measuring Site:

xxxxxxxxxxxxx, Hyderabad, Telangana

Measuring Date: 06-03-2026

Task: Structural Health Assessment of Villa

STRUCTURAL HEALTH MONITORING

Vasavi Infra Solutions is a specialized engineering firm dedicated to structural health monitoring, building rehabilitation, retrofitting, and comprehensive waterproofing solutions. The company focuses on delivering reliable, science-based assessment and long-lasting corrective measures for residential, commercial, and industrial structures.

Founders

Vasavi Infra Solutions is led by **Mr. Naveen Kumar**, an alumni of the National Institute of Technology (NIT) and a postgraduate in Structural Engineering from **Osmania University**. He brings extensive expertise in structural diagnostics, repair engineering, and project execution.

The firm is co-founded by **Mrs. Manasa Veena**, who holds an M.Tech in Structural Engineering from **KLE Technological University (KLETU)**. Her strengths include structural assessment, waterproofing systems, and engineering design solutions.

Together, they bring strong technical proficiency, research-based problem-solving, and a quality-driven approach to every project undertaken by Vasavi Infra Solutions.

Services Offered

- Structural health monitoring & detailed building inspection
- Repair and rehabilitation of distressed structures
- Structural retrofitting solutions (beams, slabs, columns, foundations)
- -Waterproofing for bathrooms, terraces, balconies, sumps, and expansion joints
- Plumbing and leakage diagnostics (dye testing, pressure testing, moisture scanning)
- Quantity estimation & material assessment
- Design services including swimming pools, sumps, sewage tanks, and structural elements
- Interior design and interior execution services
- Project Management Consultancy (PMC) services for construction and renovation projects
- On-site supervision and engineering site visits



STRUCTURAL HEALTH MONITORING

As per site condition, inspection is carried out to find the seepage roots and find the strength conditions of concrete. Following tests are carried at site:

1. IR Thermography imaging
2. Moisture mapping
3. Rebound Hammer Test
4. Endoscope test
5. Wall scanning
6. UPVT



IR Thermographic imaging



Moisture mapping



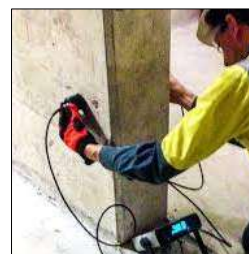
Rebound Hammer test



Endoscope test



Wall Scanning



UPVT

IR Thermographic imaging: Infrared (IR) thermography is a **non-destructive testing (NDT)** method that uses thermal imaging cameras to detect temperature variations on the surface of structures. It helps identify defects, moisture intrusion, heat loss, and hidden structural issues without causing any damage.

Moisture mapping: Moisture mapping is a **non-destructive diagnostic test** used to detect and visualize moisture infiltration in buildings. **Moisture meter** is one of the device used to measure the **moisture content** in materials like concrete, wood, drywall, and masonry and moisture mapping is carried out.

Rebound Hammer test: A crucial **Non-Destructive Testing (NDT) method** used in **retrofitting and rehabilitation** to assess the **existing concrete strength** before deciding structural repairs or strengthening. It provides **quick, on-site evaluation** of concrete quality without damaging the structure.

Endoscope test: A **Non-destructive** inspection tool used to visually examine **hard-to-reach or concealed areas** within a building. With a flexible, **waterproof design and HD imaging** capability, it allows for **internal inspection** of walls, pipes, ducts, and voids **without dismantling** structures. It is particularly useful for detecting **seepage, corrosion, or internal damage**, making it an essential device for efficient and accurate building diagnostics.

Wall scanner: A **Non-destructive testing (NDT) device** designed for detecting and locating hidden objects within concrete, masonry, and other structural materials. Utilizing advanced sensor technology, the scanner can identify embedded features such as metal reinforcement bars, electrical conduits, wooden studs, and pipes without causing any damage to the surface.

UPVT: A **Non-destructive testing (NDT) device** used to assess the quality and uniformity of concrete by measuring the speed of ultrasonic waves through it. The test is conducted as per IS 13311 (Part 1): 1992 for evaluating concrete integrity and homogeneity.

OBSERVATIONS



Fig 1: Dampness in a slab refers to the presence of moisture within the slab concrete. It occurs when water penetrates the slab due to improper waterproofing or the presence of cracks. – Grund floor



Fig 2: Dampness is observed transferring from the slab to the walls and staircase through the electrical conduit paths. – Ground floor



Fig 3: Dampness in the walls and slab is observed due to improper slope for water drainage, resulting in water stagnation and subsequent seepage into the slab. – Ground floor

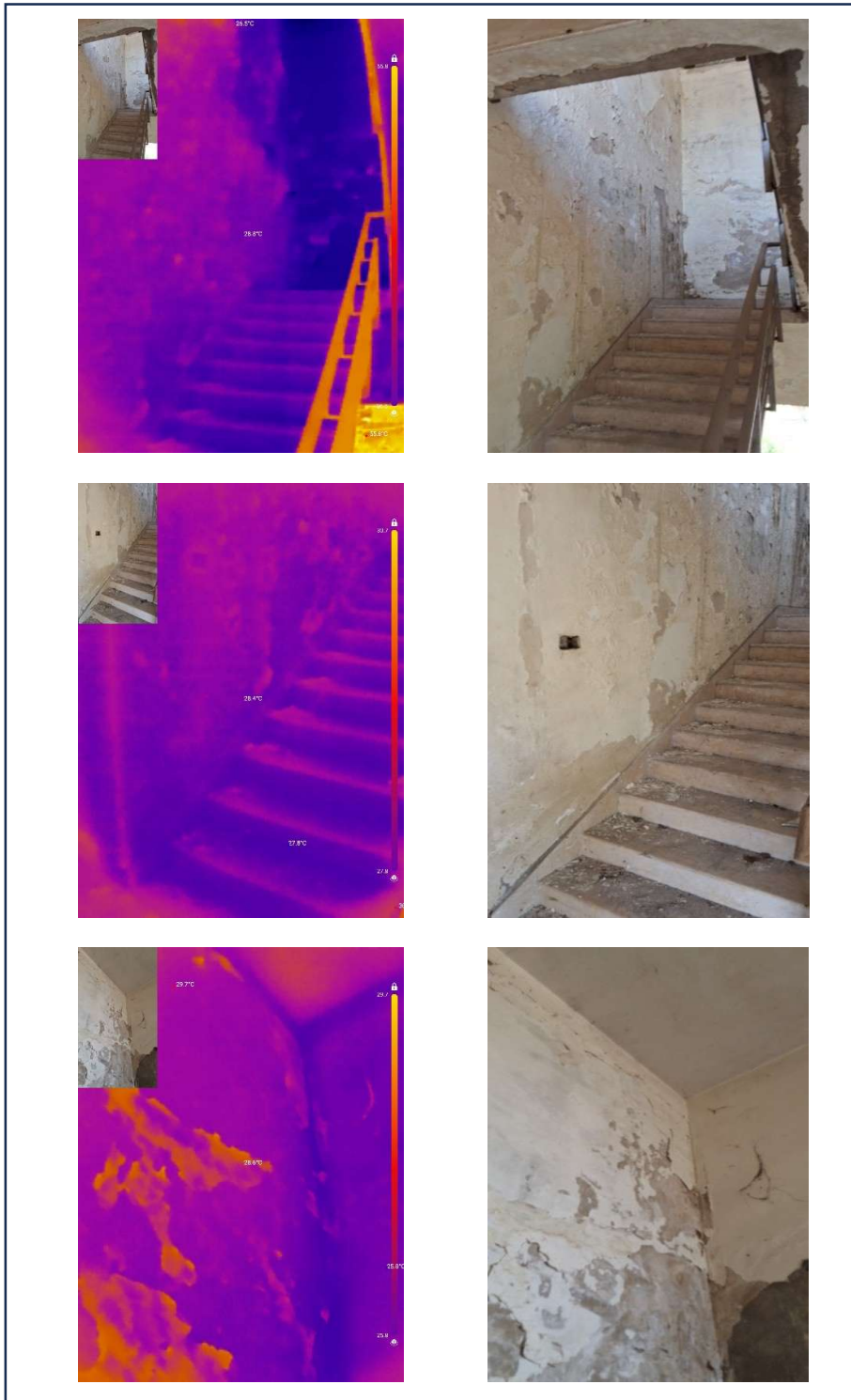


Fig 4: sseepage from the external wall face and the headroom slab due to gravitational flow has been present for a prolonged period, leading to progressive deterioration of the wall and steps.

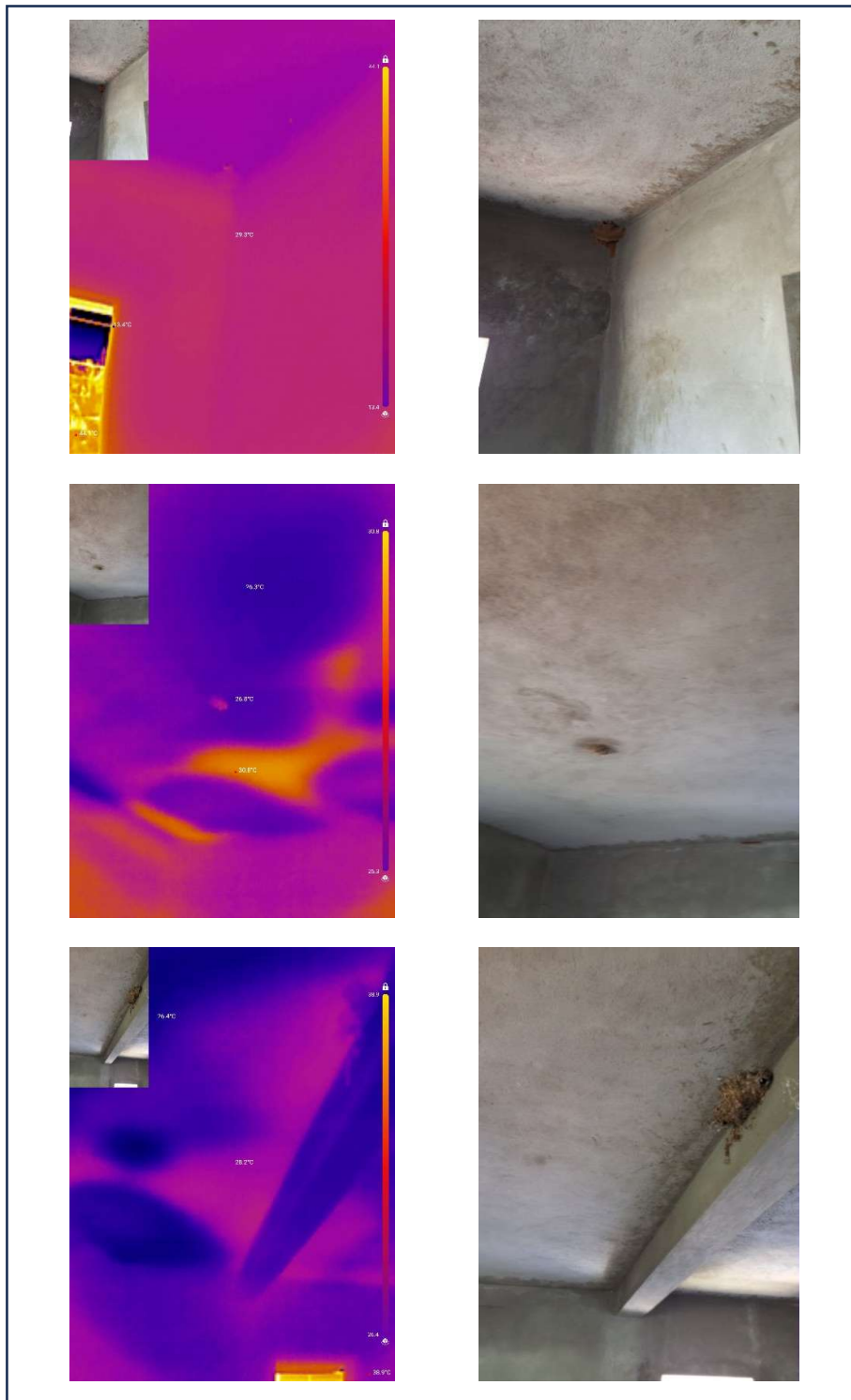


Fig 5: Severe damp patches are observed on the slab due to water stagnation on the surface and ingress of water into the concrete. Prolonged exposure of raw concrete to weather has led to moisture penetration and development of cracks. – 2nd floor

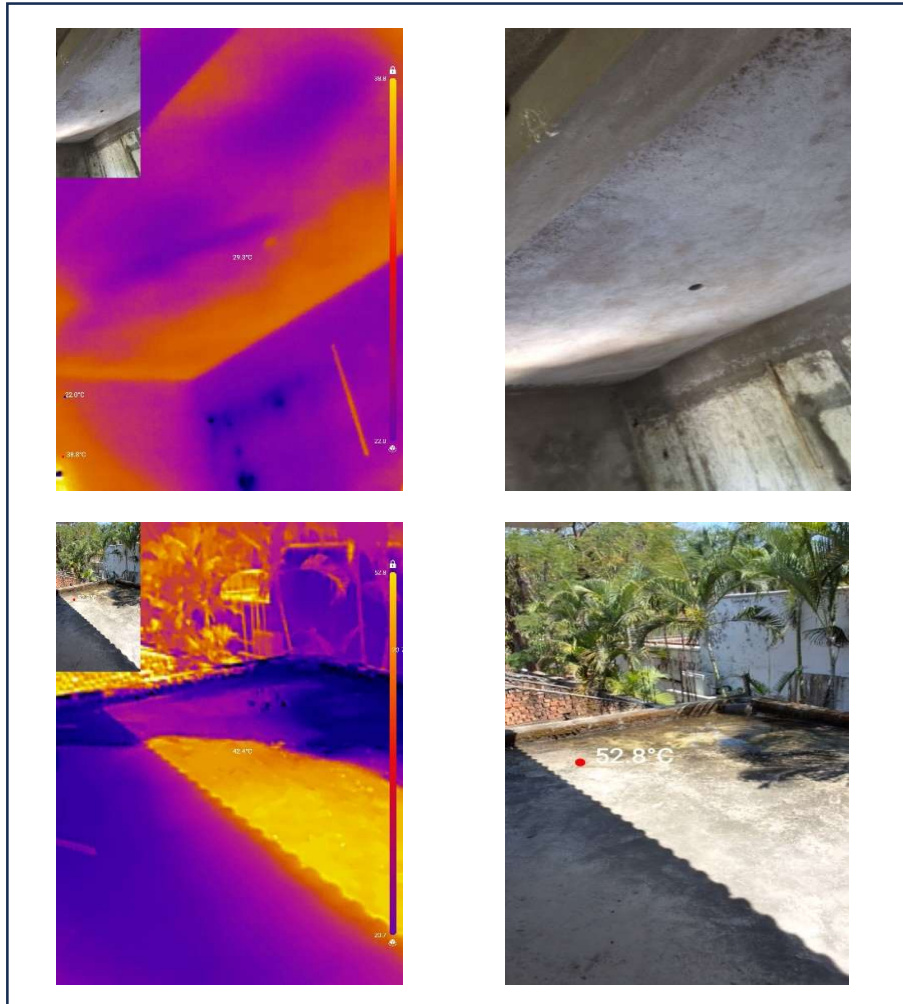


Fig 6: Water stagnation on the slab due to improper slope has resulted in penetration of water through electrical conduits and seepage into the slab soffit along the conduit path. -2nd floor



Fig 7: Termite activity is observed originating from the wooden pieces used as plumbing fixers. – Ground Floor



Fig 8: 20mm crack is observed on the 1st floor front balcony for a length of about 25ft which lead to progressive deterioration of slab



Fig 9:1. Water leakage from the slab into the walls, caused by improper compaction of concrete and absence of waterproofing on the slab, has deteriorated up to **Stage-3** .
due to improper maintenance. 2. Structure being unused and non-maintained, plantation observed on the structural elements.

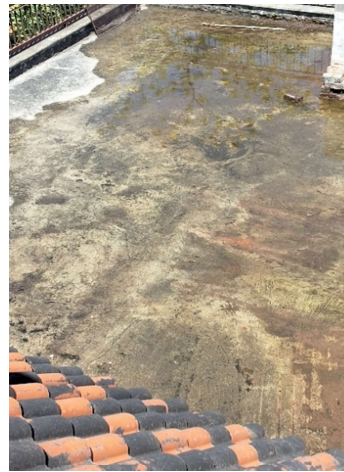
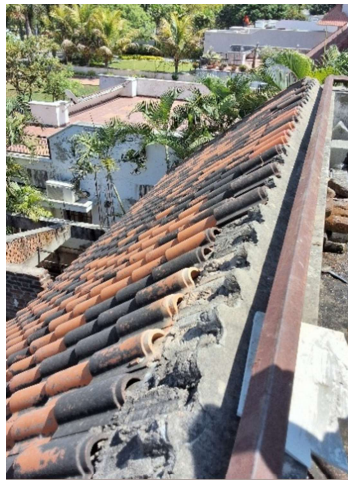


Fig 10: Loosening of Mangalore tiles in the elevation has resulted in water ingress into the slab, leading to further deterioration of the slab.



Fig 11: Debonding of the slab has occurred, leading to **Stage-3 deterioration**. – 1ST floor

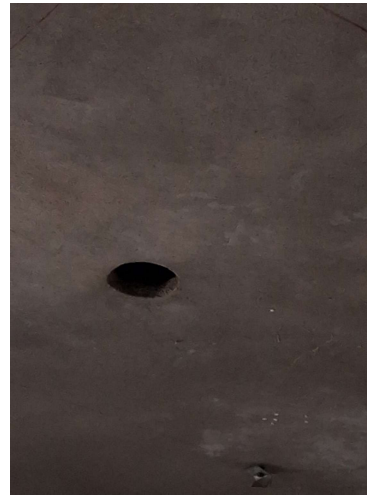


Fig 12: Dampness is observed on the slab through electrical conduit paths, and the continued moisture presence has led to deterioration of the slab. 1ST floor



Fig 13: Improper packing of drain outlets in walls and slab lead to leakage of overflown water to the below structure causing damage to the adjacent walls, beams.

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STRUCTURAL HEALTH MONITORING



The inspected structure is a **G+2 residential villa approximately 12 years old**, which has remained **partially constructed and unattended without maintenance for a prolonged period**. Significant **vegetation growth and plantation were observed on the slabs and structural elements** due to prolonged neglect.

During the inspection, **water stagnation testing was carried out on the slabs**, and **leakages were observed at multiple locations across the building**, indicating extensive water ingress through slabs, conduits, cracks, and structural junctions.

OBSERVATIONS:

Ground Floor

1. Dampness in the slab is observed, indicating the presence of moisture within the slab concrete caused by water penetration through cracks and absence of proper waterproofing.
2. Dampness is observed transferring from the slab to the walls and staircase through **electrical conduit paths**.
3. Dampness in the walls and slab is observed due to **improper slope for water drainage**, resulting in water stagnation and subsequent seepage into the slab.
4. Termite activity is observed originating from **wooden pieces used as plumbing fixers**.

First Floor

5. A **20 mm wide crack** is observed on the **front balcony slab**, extending approximately **25 ft in length**, indicating progressive deterioration of the slab.
6. Debonding of slab concrete is observed indicating **Stage-3 deterioration**.
7. Dampness is observed on the slab through **electrical conduit paths**, and prolonged moisture exposure has led to deterioration of the slab.

Second Floor / Terrace

8. Severe damp patches are observed on the slab due to **water stagnation on the surface and ingress of water into the concrete**. Prolonged exposure of raw concrete to weather has resulted in moisture penetration and development of cracks.
9. Water stagnation on the slab due to **improper slope** has resulted in penetration of water through electrical conduits and seepage into the **slab soffit along the conduit path**.
10. Seepage from the **external wall face and headroom slab due to gravitational flow** has been present for a prolonged period, leading to progressive deterioration of the walls and staircase steps.

General Structural Observations

11. Water leakage from the slab into the walls, caused by **improper compaction of concrete and absence of waterproofing**, has deteriorated up to **Stage-3**, further aggravated by prolonged lack of maintenance.
12. As the structure has remained **unused and unmaintained**, vegetation growth and plantation were observed on several structural elements.
13. Loosening of **Mangalore tiles in the elevation** has resulted in water ingress into the slab, contributing to further deterioration of the slab.
14. Improper packing of **drain outlets in walls and slabs** has resulted in leakage of overflow water into the structure below, causing damage to adjacent walls and beams.

Water Testing Observation

During the **water stagnation test conducted on the slabs**, leakages were observed in **multiple locations throughout the structure**, confirming widespread water ingress through **slabs, conduits, cracks, and drainage outlets**.

Recommendations:

1. Anti-termite treatment shall be carried out throughout the building. At least three cycles of termite treatment are recommended to completely eliminate termite infestation originating from wooden plumbing fixtures and embedded organic materials.
2. For slabs not exposed to weather, the following rehabilitation procedure is recommended:
 - Carry out crack repairs up to the mother slab.
 - Apply PVC / PU based waterproofing system over the slab surface.
 - Provide protective screed with proper slope.
 - Finish the surface with tile flooring after completion of waterproofing.
3. Epoxy pressure grouting shall be carried out at locations exhibiting severe deterioration and structural cracks to restore monolithic action of the concrete.
4. For terrace slabs exposed to weather, the following system is recommended:
 - Remove the existing wearing coat completely.
 - Perform crack repair treatment on the mother slab.
 - Provide re-screeding using high-strength polymer modified mortar with proper slope.
 - Apply APP membrane waterproofing system with protective layer.
5. At the 1st floor balcony slab, complete crack repair up to the mother slab shall be carried out. The repair area should extend at least 2 ft radius on either side of the crack to ensure effective treatment and bonding.
6. Electrical conduits passing through slabs should be properly treated. Existing conduits causing leakage should either be removed or made inactive (dead) and new electrical lines should be installed along the periphery or through alternative routing to avoid water ingress.
7. All openings, voids, and service penetrations throughout the building shall be properly sealed using non-shrink grout or epoxy mortar to prevent further water leakage.
8. The parapet wall, which has undergone significant deterioration due to prolonged water exposure and vegetation growth, is recommended to be completely dismantled and reconstructed with proper waterproofing treatment at the junction with the slab.
9. All deteriorated plaster and loose concrete should be removed up to sound substrate and repaired using polymer modified repair mortar.
10. Drain outlets and rainwater pipes should be reinstalled or repaired with proper slope and sealing to prevent overflow water leakage into the structure.
11. Vegetation and plantation on slabs and structural members must be completely removed, and the affected surfaces should be cleaned and treated before repair works.
12. After completion of structural repairs and waterproofing works, protective coatings or weatherproof coatings should be applied on external surfaces to prevent future moisture ingress.
13. It is recommended to carry out detailed structural testing using Non-Destructive Testing (UPV, Rebound Hammer) at severely deteriorated locations to assess the remaining strength of concrete before undertaking rehabilitation works.

***** End of The Report *****